

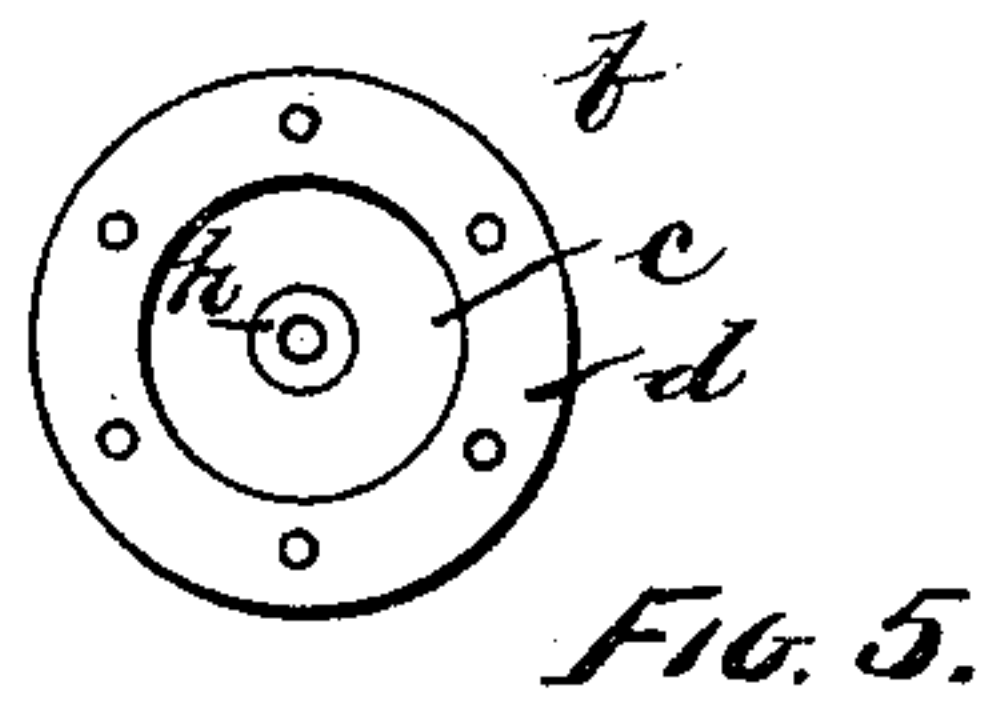
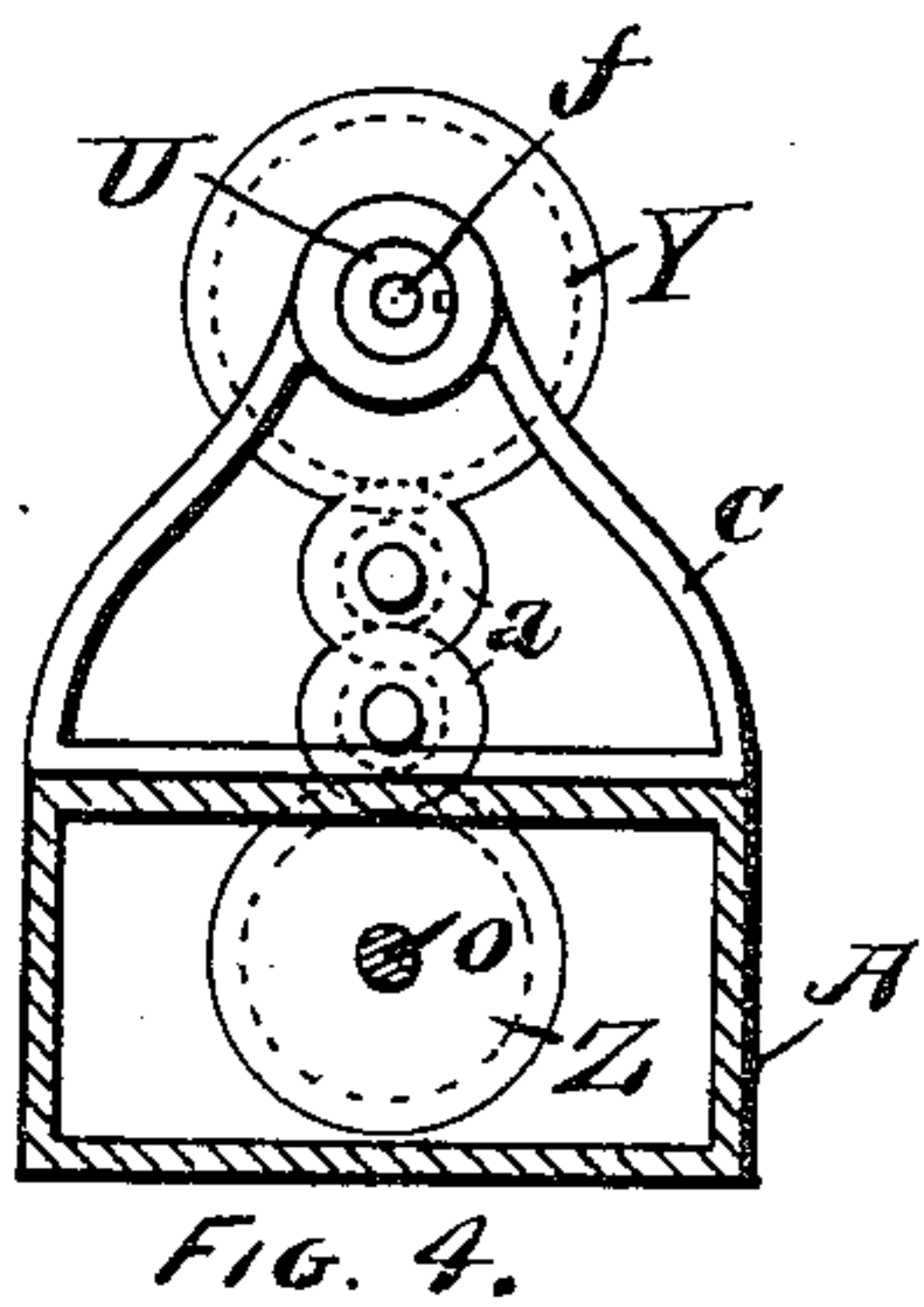
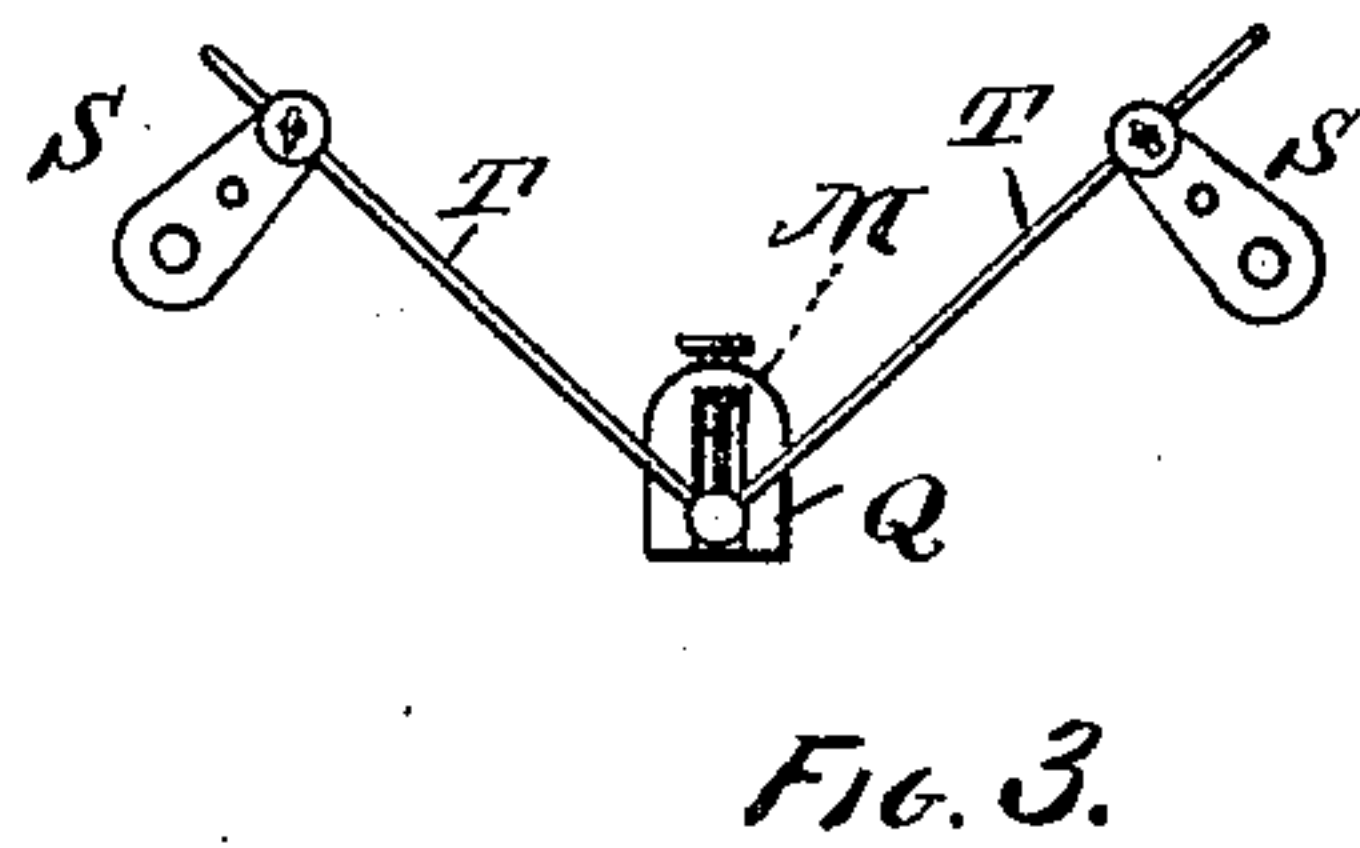
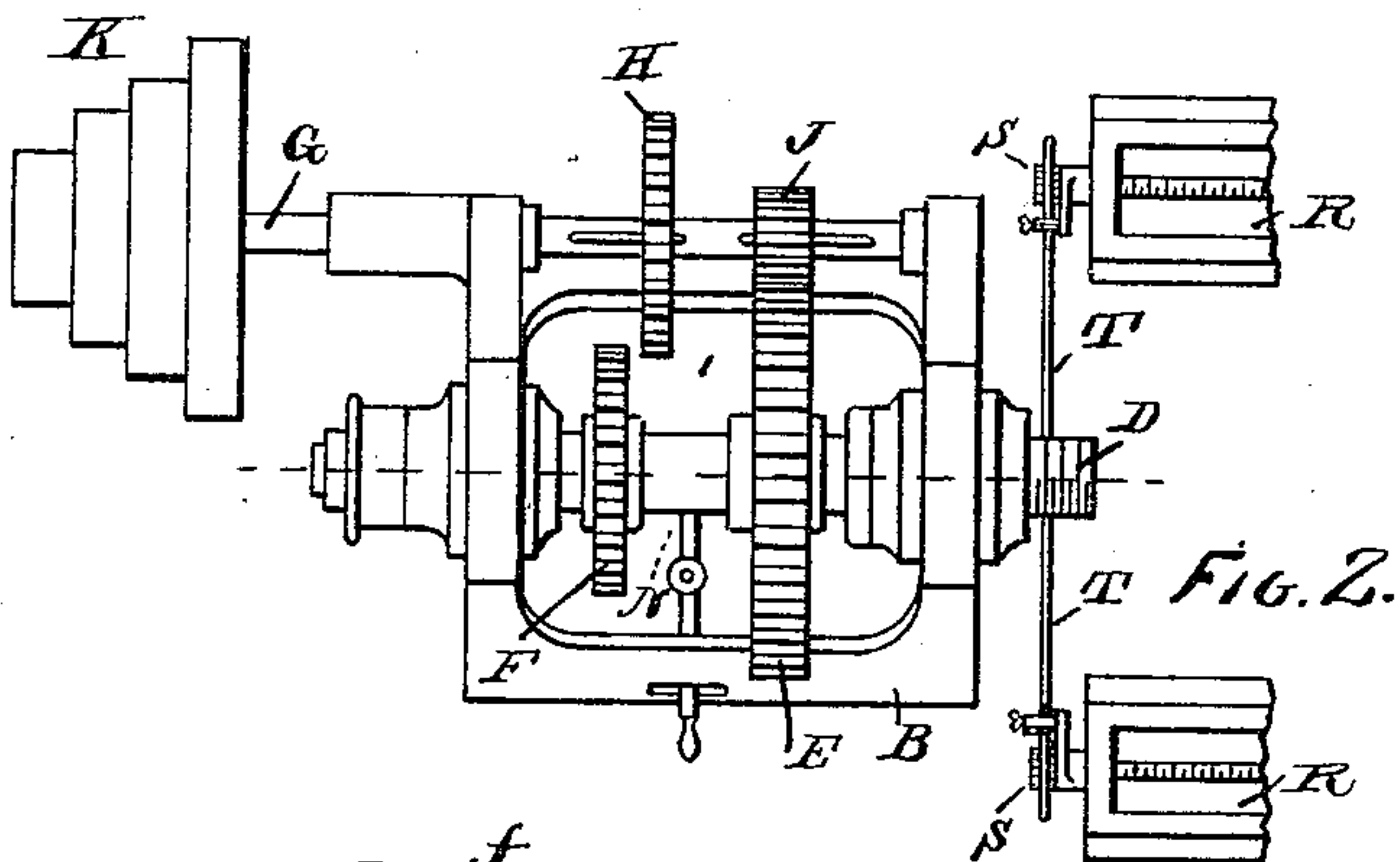
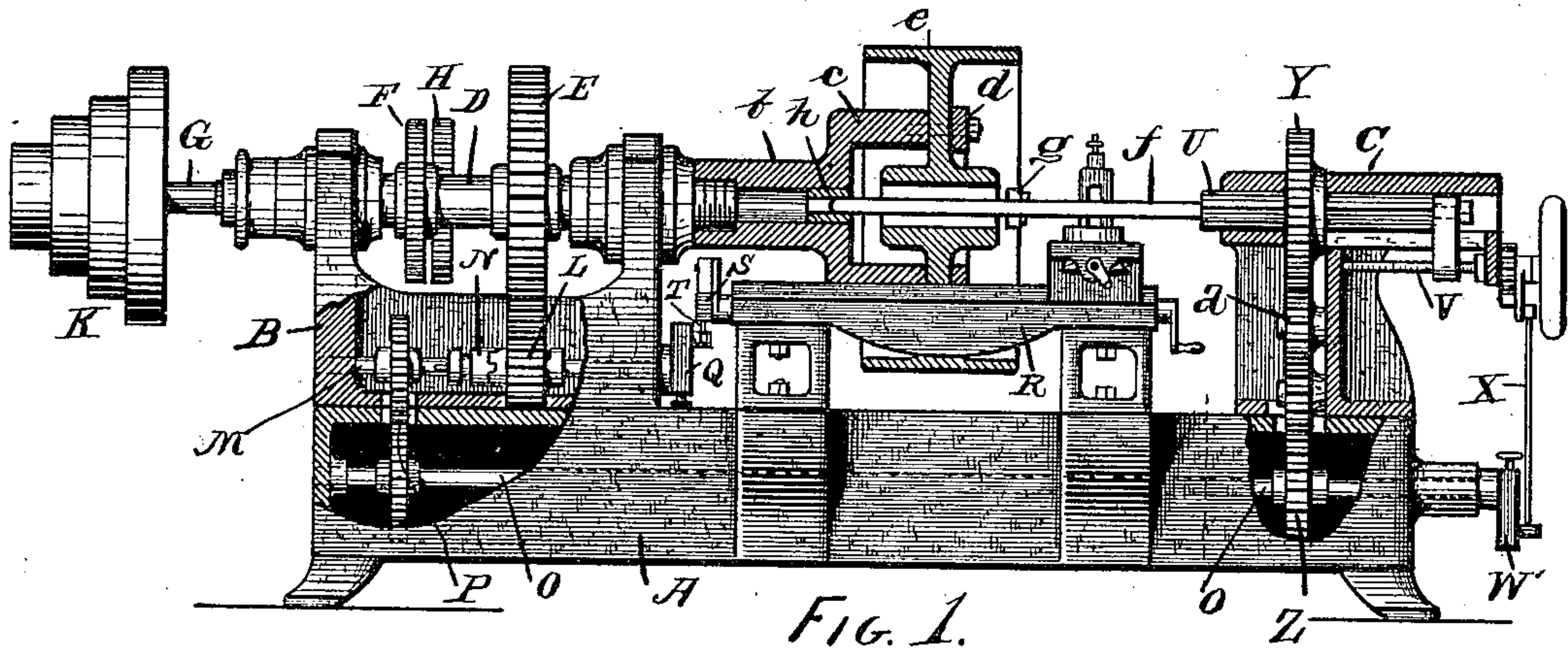
(No Model.)

P. SHELLENBACK.

LATHE.

No. 364,966.

Patented June 14, 1887.



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SPECIFICATION forming part of Letters Patent No. 364,966, dated June 14, 1887.

Application filed February 22, 1887. Serial No. 229,139. (No model.)

To all whom it may concern:

Be it known that I, PETER SHELLENBACK, of Richmond, Wayne county, Indiana, have invented certain new and useful Improvements in Lathes, of which the following is a specification.

This invention pertains to lathes for boring and turning pulleys, and the invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a lathe exemplifying my improvements, the tail-stock, the chuck, the pulley held by the chuck, and portions of the head-stock and bed appearing in vertical section, and the tool-post being omitted from the slide rest nearest the spectator; Fig. 2, a plan of the head-stock and of the left-hand ends of the rails; Fig. 3, a face view of the crank Q, which effects the feeding motion of the rail-screw, the feed-rods and the ratchet-arms of the rail-screws being shown in connection therewith; Fig. 4, an elevation of the inner face of the tail-stock, showing also the lathe-bed in vertical transverse section; and Fig. 5, a face view of the chuck with its clamping-ring.

In the drawings, A indicates the lathe-bed; B, the head-stock constructed and secured to the bed, as usual; C, the tail-stock rigidly secured at the tail end of the bed; D, the arbor journaled, as usual, in the head-stock, and preferably bored throughout its length to permit the passage therein of boring-bars; E, a spur-gear fast on the arbor; F, another but similar spur-gear fast on the arbor; G, a back shaft journaled in the head-stock to the rear of and parallel with the arbor; H, a spur-gear splined upon the back shaft and arranged to mesh with gear F, the spline permitting the gear H to be moved along its shaft, so as to mesh with or be free from the gear, if so desired; J, a pinion similarly splined upon the back shaft and arranged to mesh with the gear E; K, a driving-cone on the back shaft, by which motion is to be transmitted to the lathe from any suitable counter-shaft; L, a pinion driven by gear E, and fitted to revolve freely on a shaft disposed below the arbor; M, the shaft just referred to, the same being jour-

naled in the head-stock below and parallel with the arbor; N, a clutch upon the shaft, serving as a means by which the pinion L may be locked to the shaft when it is desired that the shaft shall turn with the pinion; O, a shaft disposed longitudinally within the lathe-bed and journaled therein; P, a pair of gears serving to transmit motion from the shaft M to shaft O; Q, a feed-crank upon the inner end of shaft M, said crank being provided in a common manner with an adjustable crank-pin, the crank lying just below the arbor and against the inner end of the head-stock; R, a pair of rails supported by the lathe-bed, one rail at each side of the bed, these rails being provided each with a slide-rest and feed-screw, as is common with the rails of metal-planing machines, and, frequently, of pulley-lathes; S, pawl-and-ratchet mechanism, of the usual character, at the head-stock end of the rails, serving in effecting the intermittent rotation of the rail-screws to cause the longitudinal traverse of the turning-tools; T, a pair of feed-rods, with their inner lower ends engaging the crank-pin of the crank Q, and with their outer ends engaging the pawl-arms of the pawl-and-ratchet mechanism in the manner usual with such feed-rods as singly employed in connection with metal-planing machines; U, a tail-spindle, the same being fitted to both slide and revolve in the tail-stock; V, a tail-screw for traversing the spindle, the same being provided with a hand-wheel, by means of which the traversing of the spindle can be effected by hand, and also with a pawl-and-ratchet mechanism through which it may receive intermittent rotation by power; W, a feed-crank, similar to crank Q, upon the tail end of shaft Q; X, a feed-rod, reaching from this crank to the pawl-and-ratchet mechanism of the screw V; Y, a spur gear splined to the tail-spindle; Z, a spur-gear upon the shaft O, below the tail-stock; a, a train of gearing, serving to transmit motion from gear Z to gear Y; b, a chuck secured to the end of the lathe-arbor, and provided with an axial bore from the nose of the arbor outward; c, an enlarged cup-shaped nose to the chuck; d, a clamp-ring attached by bolts to the face of the chuck-nose; e, a pulley secured in position to

be operated upon by the tools, the arms of the pulley being clamped between the clamp of the clamp-ring and the face of the chuck-nose, one side of the pulley-hub entering the cup portion of the chuck-nose; *f*, a cylindrical boring-bar secured to the tail-spindle, and intended to rotate and slide therewith; *g*, a double-ended cutter of ordinary construction, secured in the boring-bar at about its mid-length—as by means of mortise and key—in a well-known manner, and *h* a bushing in the outer end of the axial bore of the chuck, this bushing fitting and serving to support the boring-bar. Motion is given to the back shaft by a suitable belt, the gear *H* being moved along the back shaft so as not to engage gear *F*, and the pinion *J* being moved along the back shaft, so as to engage pinion *E*, as shown in the drawing, the back shaft serves to impart motion to the arbor and to the pulley held by the chuck. The revolution of the arbor gives motion to pinion *L*, and when the clutch *N* is thrown into engagement with the pinion motion becomes transmitted to the feed-crank *Q*, and through the medium of rods *T* oscillating motion is imparted to the pulley-arms upon the ends of the rail. By this means the longitudinal feeding motion is imparted to the slide-rest. Under the circumstances referred to the pulley may be turned by lathe tools in the two slide-rests. The rails should be secured adjustably to the bed, so as to be capable of being moved to and from each other according as pulleys of small or large diameter are being operated upon, thus permitting the work to be done with turning-tools projecting but a short distance from the tool-post. The rails may of course be secured parallel to the axis of the lathe, so as to turn the face of the pulleys straight; or the rails may be adjusted angularly with reference to the axis of the lathe, so as to produce a crowning face upon the pulleys. These adjustments of the rails are well-known devices in connection with pulley-lathes.

The manner of securing the pulley in the chuck will be obvious from the drawings, the arms of a pulley being simply clamped between the clamp-ring and the nose of the chuck. The nose of the chuck being faced off truly, it follows that the finished pulley as it revolves upon its axis will have its arms in a plane at right angles to the axis of the pulley, it being assumed, of course, that the pulley will have its edges trued while in the lathe. This manner of chucking permits of heavy cuts being taken without danger of breaking the pulley. The pulley is being bored while being turned. While the arbor and pulley is revolving slowly in one direction, the tail-spindle, with its boring-bar, revolves more rapidly in the other direction, the rotary motion being effected through the shafts *N* and *O* and their

connecting-gearing. At the same time the end-wise feeding of the boring-bar is effected by the crank *W* transmitting motion to the feed-screw *V* through the pawl-and-ratchet mechanism. By throwing clutch *N* out of engagement the rotary motion of the tail-spindle is stopped. In case boring only is to be done, or in case very small pulleys are to be turned, a greater speed can be given to the lathe-arbor by sliding pinion *J* out of gear and sliding gear *H* into gear. By this means two changes of speed may be secured in connection with each step of the driving-cone. As the boring-bar feeds inward, its end is supported in the bushing *h*, and its end passes into the axial bore of the chuck, and, if necessary, on into the bore of the arbor. Boring-bars, boring-cutters, and bushings for the bar will of course be chosen of a size adapted for the work in hand, the boring-bar being secured in the tail-spindle in a manner common in attaching drills and boring-bars in the spindles of drilling and boring machines.

I claim as my invention—

1. In a lathe, the combination, substantially as set forth, with a bed, a head-stock, an arbor, a tail-stock, and a slide-rest, of a spindle fitted to revolve and slide in the tail-stock, a boring bar secured to said tail-spindle, a shaft reaching from the head-stock to the tail-stock, and gearing arranged to transmit motion from the arbor to said shaft and from said shaft to said tail-spindle.

2. In a lathe, the combination, substantially as set forth, with a bed, a head-stock, an arbor, and a pair of rails supported by the bed, of a shaft journaled in the head-stock below and parallel with the arbor, gearing arranged to transmit motion from the arbor to said shaft, a feed-crank upon said shaft below the nose of the arbor, and a pair of feed-rods engaging said crank and the feed mechanism of the rails.

3. In a lathe, the combination, substantially as set forth, of a bed, a head-stock, an arbor, a tail-stock, one or more slide-rests, a tail-spindle fitted to slide and revolve in the tail-stock, boring-bar attached to the tail-spindle, a shaft journaled in the bed parallel to the axis of the lathe, gearing arranged to transmit motion from the arbor to said shaft and from said shaft to said tail-spindle, a feed-crank upon the tail end of said shaft, and a rod engaging said feed-crank and a feed mechanism for the tail-spindle.

4. In a lathe, the combination, substantially as set forth, of chuck *b*, having cup-shaped nose *c*, clamp-ring *d*, and a lathe-arbor.

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Witnesses:

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